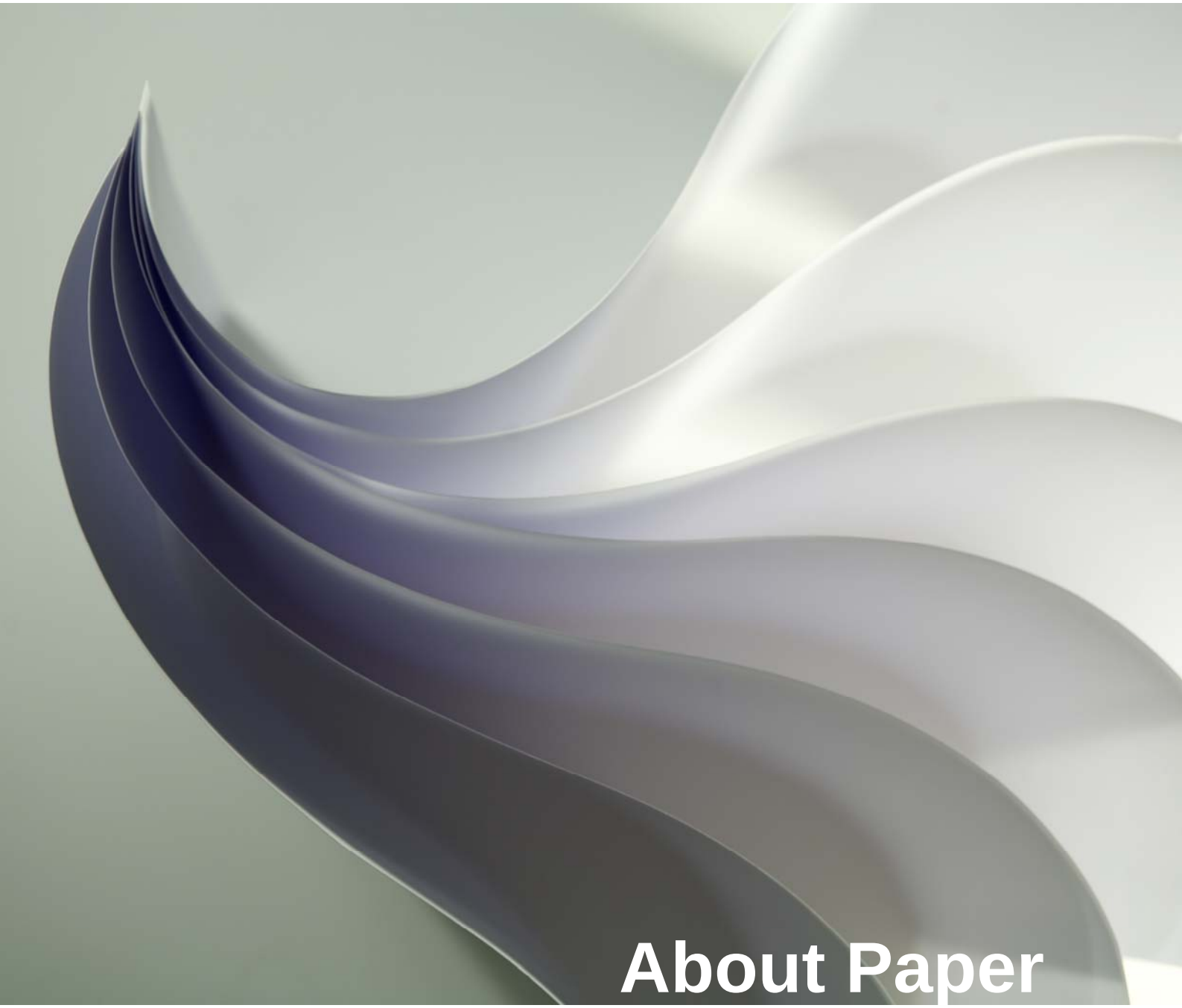


About Paper

Metallized paper

Metallized Paper

Table of contents

Metallized Paper

1. Definition of metallized paper

A metallized paper is a product that is coated with a layer of aluminium with a matte or gloss finish which offers decorative and protective properties to the product.

Two different systems can be used to create metallized paper:

- **Lamination.** This involves gluing a paper, normally non-coated, to a sheet of aluminium with a thickness of between 9 and 12 microns. This system is used increasingly less owing to the high consumption of aluminium.

  In our case, on occasions we use this product as a self-adhesive sheet with a matte or gloss finish, in silver (the aluminium's natural colour) or gold (tinted with a colorant). The term laminated is usually used instead of metallized when naming this product.

- **Vacuum metallization.** This system, which we are going to look at in depth as it is what we produce, consists of depositing a super-fine layer of high vacuum aluminium of around 0.08 to 0.1 g/m^2 on a 1-side coated substrate. In this case, the main advantage is that 300 times less aluminium is used than in the previous case.

2. High vacuum metallization

As we have just seen, we use the high vacuum metallization system and, for this reason, this is what we are going to look at in depth in subsequent chapters. This is a process that basically consists of depositing a super-fine layer of aluminium (around 0.08 to 0.1 g/m^2) on a previously varnished 1-side coated substrate within a high vacuum atmosphere.

This metallization system allows us to obtain paper with certain general characteristics that it is important to clarify:

- The metallized appearance of the paper gives added value to products that contain it.

- The product obtained is recyclable in a similar way to other special papers. This gives it a great advantage over complexes such as foil and many other products designed for flexible packaging such as film and paper complexes.

- The metallized surface of the product is plastic in nature, or in other words, it is waterproof and non-absorbent.

- It offers a series of barrier properties to the coated paper, forming a barrier against light, water vapour, oxygen and odours.

- If the paper is to be used for printing it is important to consider that the surface to be printed is plastic in nature, meaning that the printing technique is closer to the printing of plastic films than that of paper.

- The reactivity of this paper to changes of moisture is very strongly asymmetrical owing to the plastic nature of one of its sides. This means that this paper reacts more extremely to changes in environmental moisture.

2.1. Production methods

In turn, high vacuum metallization permits two production possibilities:

- **Transfer metallization.** This consists of high vacuum metallization of a plastic (usually polyester) for subsequent transferral to the paper. As figure 2 shows, this process can be divided into four stages:

  - **Stage A:** firstly the spool of plastic material is metallized using a high vacuum process.

  - **Stage B:** the metallized plastic is attached to the sheet of paper using adhesive.

  - **Stage C:** the product hardens and stabilizes.

  - **Stage D:** both sheets are separated into plastic and paper, leaving the layer of metal attached to the paper only.

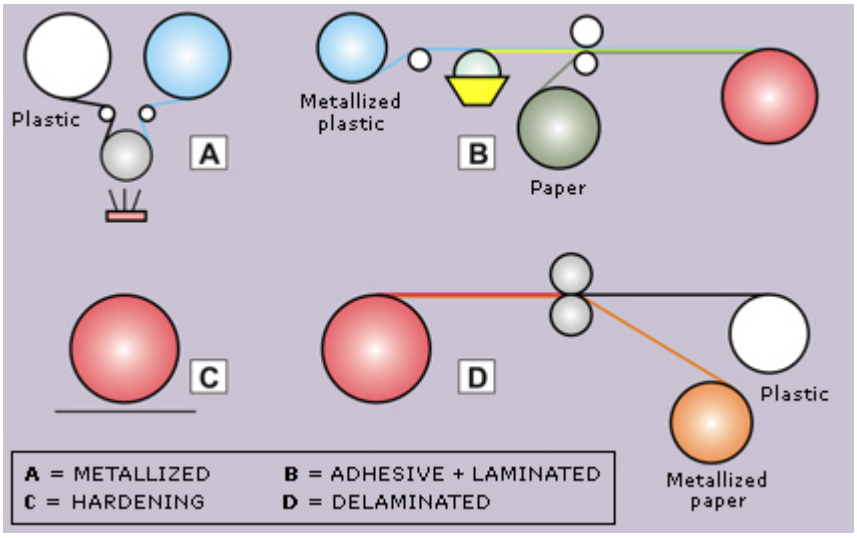


Fig. 2: Diagram of transfer metallization.

- **Direct metallization.** In this case, metallization is carried out directly on the paper as is shown in diagram form in figure 3, and can be divided into two stages:

- **Stage A:** the paper is varnished to prepare it for subsequent metallization.
- **Stage B:** the paper is metallized using a high vacuum system.

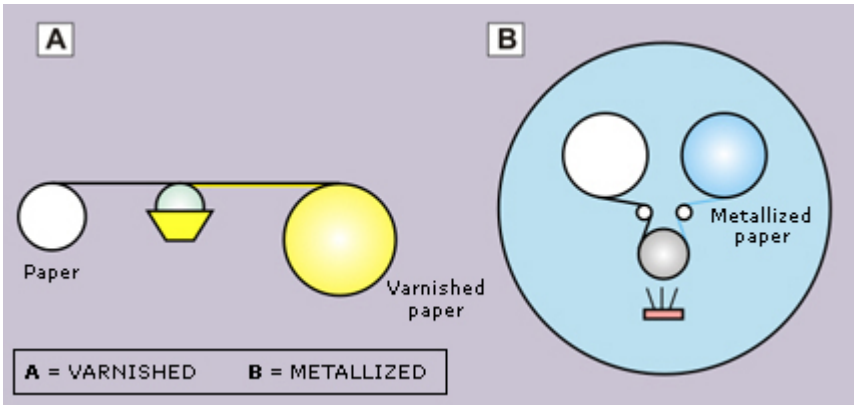


Fig. 3: Diagram of direct metallization.

Direct metallization is the method used at Torraspapel's factory in Leiza and we will talk extensively about it throughout this unit.

The main advantages and disadvantages of the two systems will be discussed next:

ADVANTAGES AND DISADVANTAGES OF HIGH VACUUM SYSTEMS

Transfer	▣ Greater mirror effect. ▣ Almost any surface can be metallized. ▣ Especially suitable for cases and decoration. ▣ A more expensive and complex process. ▣ Two-part adhesives systems are used during the lamination process. Given that they need up to 24 hours to cure, quality cannot be controlled until these 24 hours have passed.
Direct	▣ Very competitive for all label and cigarette markets due to their lower cost. ▣ A simpler production process.

- Currently metallized substrates have improved in gloss and appearance to such an extent that they are coming close to the transfer system in these aspects.

2.2. The direct metallization process

The process of producing metallized paper by the direct high vacuum method consists of three independent processes that we will see in this unit, which are the following:

- **Varnishing.** A thin layer of varnish is applied to the coated substrate in order to prepare the surface for subsequent metallization.
- **Metallization.** The varnished paper is placed in a "metallization chamber" where the layer of aluminium is applied.
- **Lacquering.** A thin layer of lacquer is applied to give the final characteristics of the paper (printing, colour, etc). A dorsal treatment is also carried out during this process and the colour applied (when it is gold).

In figure 4 we can see the different layers of the metallized paper based on the three previous processes. Although for ease of comprehension the paper substrate is shown in this figure as being separated from the coated paper, we can say that the product used is 1-side coated, or in other words, the substrate used is already coated.

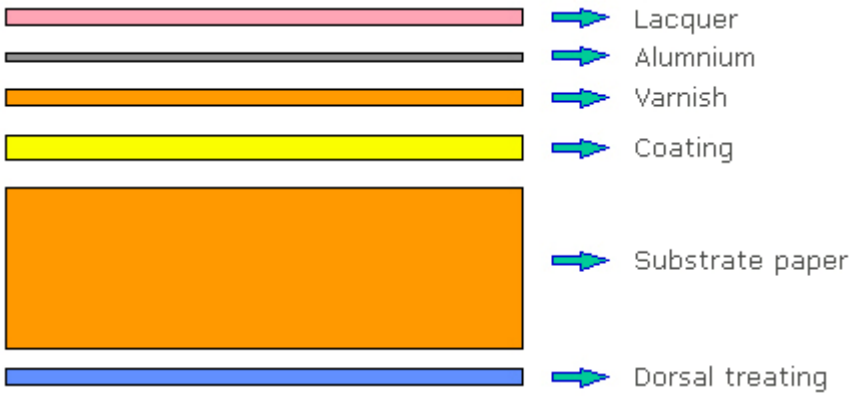


Fig. 4: Structure of the metallized paper.

We should point out that in some types of paper a treatment known as embossing is also used, which allows us to modify the appearance of the paper and alter some of its technical characteristics.

The metallized paper is processed into sheets and reels, using similar machines to those used in other factories. Finally, the products pass through the packaging section, where final checks are also carried out.

3. Varnishing

Varnishing is the first treatment given to the substrate before placing it in the metallization chamber. We will discuss why we are obliged to do this and the main technical details.

The varnish acts as a base coat on the coated substrate, and determines the matte or gloss finish of the finished product.

The varnishing process is done as the aluminium takes on the image of the surface on which it is deposited and, therefore, the smoother this surface the greater shine achieved. In addition, the plastic chemical nature of the varnish offers a better and more uniform appearance to the paper after it is metallized. Furthermore, as well as giving the paper these characteristics the varnish also helps save aluminium.

The following image shows the varnisher used on metallized paper.

Fig. 5: Image of the varnisher.

3.1. The varnishing process

The varnish is applied in the varnisher through a process similar to gravure printing. Once the varnish has been applied, the paper passes through the hot air drying unit in order to remove the solvents of the varnish and therefore dry the paper until it has a moisture level of between 2 and 3%. Next, and within the same varnisher, the paper passes through a set of refrigerated rollers which prevent the paper from sticking in the winder.

The amount of varnish will depend on the weave applied to the roller and varies according to the needs of the final use of the paper, or in other words, whether it is for labels, gift wrap, tobacco, etc. So, for example, 1.3 g/m^2 is usually put on labels, and 2.2 g/m^2 on gift wrap.

The viscosity of the varnish is also important, as this is also related to the amount of varnish applied.

The following figure shows a diagram of the varnisher.

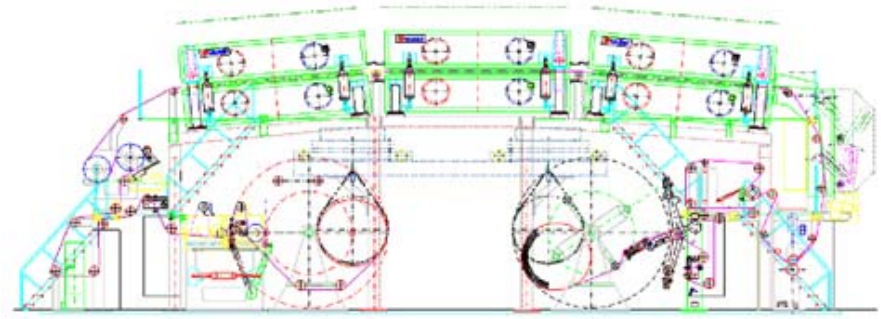


Fig. 6: Diagram of the varnisher.

3.2. Controls in varnishing

The following continuous controls are established for correct varnishability of the paper:

- Control of the viscosity of the varnish within the deposit located in the head of the varnisher.
- Monitoring of both the continuous production of the layer, and of moisture and weight through the screen of the varnishing machine.
- Controls of the application of the varnish by testing coverage of the paper and gloss.
- Controls of defects using quality monitoring sheets.

New varnishers present a series of significant advantages such as continuous automatic controls across the whole width of the reel, of the total weight, moisture and varnish layer, as well as the application system in closed chamber which prevents the formation of foam and splashes of varnish on the paper which could alter the metallization conditions.

The use of ceramic rollers which guarantee greater regularity in the time taken to apply the varnish is also important, and it should also be pointed out that the paper passes through a floating tunnel, or in other words, a cushion of air without rollers, which improves uniformity in the moisture profile of the paper and prevents it from being scratched.

3.3. Types of varnish

Three types of varnish are used: acrylic, acrylic-styrene and nitrocellulose**.** Each type of varnish is chosen according to the final use of the product, and the main parameters to be taken into account in this choice are:

- Type of finish (matte or gloss, level of shine required, etc).
- Mechanical demands of the process that the product will undergo (flexibility, resistance to moisture, etc).
- Adhesion of the adjacent layers (aluminium and lacquer).

Types of varnish according to the final application of the product

Different classes of varnish can be used on metallized paper depending on the final use of the paper. In the unit on coated products we talked about the different metallized products that we produce and those on which the varnishes given below would typically be used:

APPLICATIONS OF THE DIFFERENT TYPES OF VARNISH	
Gifts	Acrylic-styrene (high gloss).
General labels	Acrylics.
Self-adhesives	Acrylic with nitrocellulose.
Tobaccos	Water based acrylic-styrene.

4. Metallization

Metallization is probably the most critical point during the production of this product and we are now going to talk about the production process and the controls that should be carried out. This process takes place in the metallization chamber.

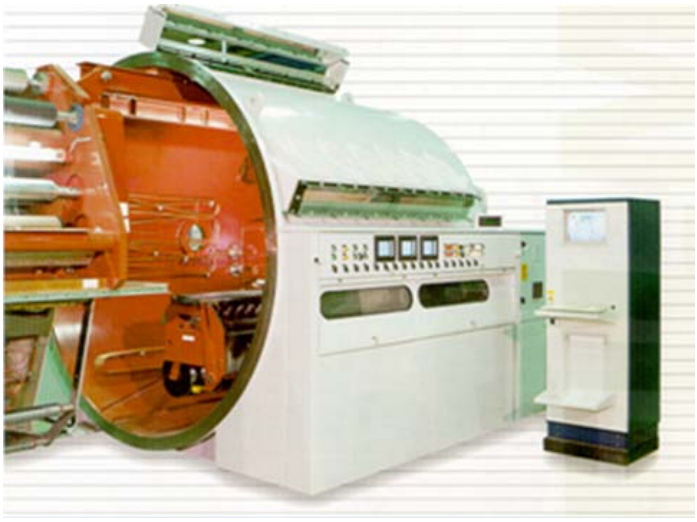


Fig. 7: Metallization chamber.

4.1. Metallization process

Once the reeks of paper have undergone the varnishing process they are sent to the metallization area, where they are introduced one by one in order for the layer of aluminium to be applied to the paper. The following figure shows a diagram of the machine where the main parts involved in the process can be seen.

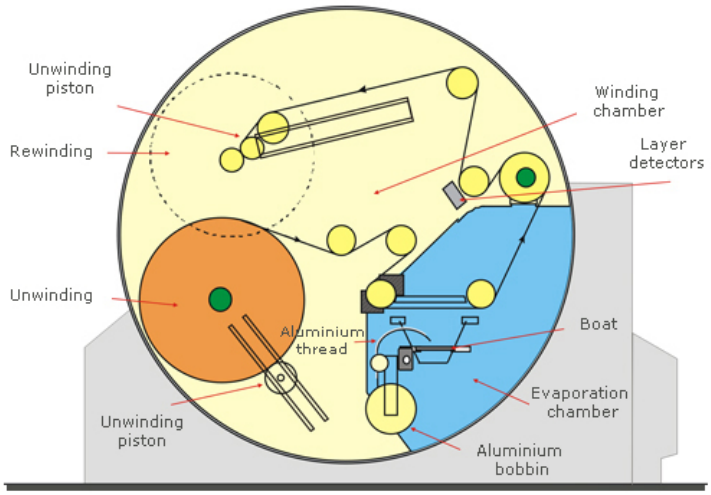


Fig. 8: Diagram of the metallization chamber.

The metallization process can be divided into the following phases:

1. **Placing** the reel in the metallization chamber.
2. **Generating the vacuum** in two phases: firstly a cascade pumping system and then a system of cryogenic panels for the water.
3. **Heating the evaporators** (boats) to a temperature of 1,500 °C.
4. **Evaporation of the aluminium.** For metallization, the aluminium is coiled in the form of small "wire bobbins" which touch the boats which have been previously heated to 1,500 °C. When it makes contact with them, the aluminium melts and evaporates.
5. **Depositing of the aluminium by condensation** on the paper. To do this, the paper is firstly cooled by passing along rollers with water up to a temperature of 15 °C, and on contact with the paper the aluminium condenses on its surface. The amount of aluminium applied is between 0.08 and 0.1 g/m^2.
6. **Extraction of the reel** once the operation is finished, after which the machine is cleaned and prepared to metallize the next reel. The process does not permit automatic reel changes, or in other words, it has to be stopped after metallization, generating a significant amount of dead time.

4.2. Controls of metallization

There are a series of controls within the metallization chamber that allow the specifications of the finished product to be maintained. The most important control systems are:

- Control of the vacuum and the heating temperature of the boats.
- Control of the superficial resistivity of the paper after metallization across the entire bandwidth. The measurement is made in ohms per surface area and controls the amount of aluminium that each of the boats applies to the paper. This prevents a blue-tinged defect that forms on the metallized product and which is caused by a tiny amount of deposited aluminium.
- Control of individual charge for each boat that has an effect on the intensity of current which circulates through it and the speed at which the aluminium thread advances.
- Control systems of the vacuum to prevent burns, which are brown shades that the paper takes on when the vacuum is not correct.

A significant advantage of modern metallization machines is that they allow us to work with a paper with a moisture content of up to 2.5%, which reduces the hysteresis that it undergoes in the drying-rehumidifying processes.

5. Lacquering

Lacquering is the process after metallization of the paper. This process takes place in the lacquering machine**.**

Fig. 9: The lacquering machine.

Lacquering is done to give the characteristics necessary for printing, whether in offset, gravure, etc. It also serves to make the product appropriate for its final use and to give it colour. The latter aspect will only be necessary when producing a coloured metallized paper, such as a gold finish. As we have said before, when we talk about metallized silver this is the natural colour of the aluminium.

5.1. Lacquering process

Once the reel is placed in the lacquering machine, the metallized paper passes through corona treating that facilitates the anchorage of the lacquer on the aluminium. This corona treating acts by increasing the surface tension of the metallized surface.

Once the corona process has taken place the lacquer is applied using a system of gravure, as in the varnisher, and is subsequently dried using hot air tunnels. Approximately 1 g/m^2 is applied. When the product is coloured, it is the lacquer itself that is coloured with the final colour of the product. The classic colour is gold, but from a technical point of view other colorants could be used if this were necessary.

Once dry, the metallized paper passes through cooling rollers, and the water and the dorsal treatment are subsequently applied. This is to ensure that the paper has the final moisture necessary for the finished product and to maintain flatness when it is transformed into sheets or labels. This dorsal treatment is applied using a system which

applies rollers and a steam ramp. Also installed is a run which gives time for the water to penetrate into the other side of the paper before final rollering.

The following figure shows a diagram of the lacquering machine.

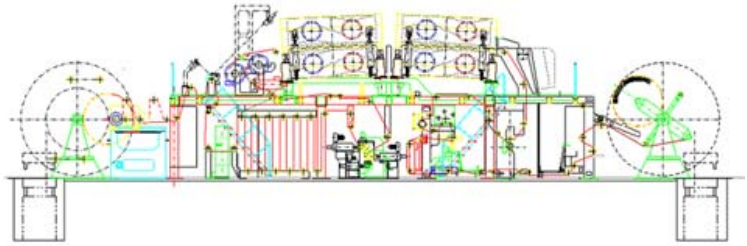


Fig. 10: Diagram of the lacquering machine.

5.2. Controls of lacquering

The main lacquering controls are:

- Control of corona treating, relating this treating to the speed of the machine.
- Control of the viscosity of the lacquer.
- Control of the profile of the layer of lacquer applied to the entire width of the bobbin, as well as the final moisture of the finished product, using an infrared system.
- Control of the final weight of the product, as well as the action of a scanner which uses a laser that marks superficial defects as well as their location within the bobbin.

A significant advantage of the new lacquering machine is the LAS humidification system which helps achieve greater uniformity in dorsal treatments and allows us to vary the amount of dorsal solution according to moisture and flatness. Also, as in the varnisher, the application system takes place in a closed chamber preventing scratches and splashes on the paper, and the formation of foam. The use of ceramic rollers also gives greater regularity of application over time.

Another significant improvement is the increase in productivity as the machine allows automatic reel changes and the introduction of reels with a larger diameter.

A very important point to note in both the varnisher and the lacquering machine is the system of solvent removal by controlled combustion in catalytic ovens, preventing emissions of solvents to the atmosphere and allowing us to release quantities of gases at levels which are much lower than those permitted by current legislation.

5.3. Types of lacquer according to the final application of the product

The lacquer applied is chosen according to the needs of the finished product and the varnish that has been used. These days we use acrylic (the majority, due to the versatility of acrylic polymers), water-based acrylic styrene, nitrocellulose and vinylic lacquers. The main characteristics of these lacquers will be described as follows.

CHARACTERISTICS OF LACQUERS USED IN METALLIZED PAPER	
Acrylic	It is very versatile: permeable to caustic soda, ink retention, transparency, etc.
Water-based acrylic styrene	Good anchoring of inks and high resistance to heat blocking.
Nitrocellulose	Very low residual solvents (VOC).
Vinylic	Resistance to alcohols.

6. Embossing

Embossing is a physical treatment that is used in certain grades and that takes place in an embossing machine.

The embossing machine consists of two rollers, one hard and one soft. The hard roller has an engraved surface and the pressure of this engraved roller on the paper alters the surface of the latter, cracking the layers of lacquer, aluminium and varnish, giving new properties to the finished product.

Embossing is carried out for the following reasons:

- **Changing the appearance of the surface (aesthetic).**
- **Greater rigidity.**
- **Greater ink retention.**
- **Longer transfer time.**
- **Faster drying of offset inks.**

In short, embossing does not just serve to modify the superficial appearance of the paper but can also alter its conditions, especially in the returnable bottle labelling market, as it improves ink retention in the label, reducing contamination of the caustic soda bath and favouring transfer, which results in quick release of the label making it easy to remove from the washing bath.

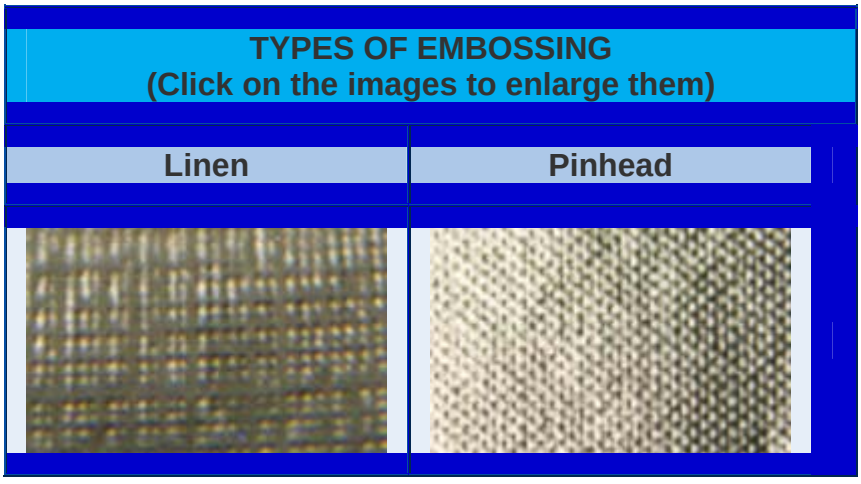
In fact, especially in the gravure market, the end user of the product usually asks for smooth paper (which is essential to achieve correct printing with this system) and it is subsequently embossed after printing to facilitate the release of the label. The products that our company embosses are basically designed for offset printing.

We therefore vary the appearance of the product as well as its characteristic techniques according to the engraving on the embossing roller. The embossing intensity can be modified according to the embossing roller (depth of engraving, design, etc), the pressure, the type of counterpressure roller and the speed of the embossing machine.

It is very important to achieve regularity in the depth of embossing; this will be affected by the speed of embossing, the pressure between both rollers and the pumping of the hydraulic system in each side, deformation of the counterpressure roller and the frequency of its rectification.

6.1. Types of embossing

There are three types of embossing, known as Linen, Brushed and Pinhead, depending on the engraved surface. The appearance of the two types Linen and Pinhead will now be shown (the Brushed finish is not shown; it has been recently installed).



7. Types of metallized paper

Our product's brand name is **Metalvac**, and there are different specialities within this brand that we will now describe:

- **Metalvac E.** This product is used for bottles which are non-returnable, for example, liqueurs, wines, etc. It is made in weights of 75, 85 and 95 g/m^2, and can be printed in any printing system.

Metalvac E UV is available for when the printing uses UV (ultraviolet) dried inks.

- **Metalvac E WS.** The term WS indicates that the paper has wet strength. Given that the aluminium usually forms a closed layer, which along with the inks can make it difficult to remove the label or lead to excessive soiling of the washing baths, we will now list a series of special products that are available:

  - **Metalvac E WS QR Plus.** This is a product for returnable bottle labelling and is used in conventional offset printing. QR stands for "quick release", or in other words, this product is specially designed to achieve quick release of the labels during bottle washing without soiling the bath. It is recommended that the paper be printed with an embossed finish.

  - **Metalvac E WS IR.** This product is especially designed for gravure printing. Embossing after printing favours the release of the label. The letters IR mean that it is ink resistant, resulting in minimal soiling of the washing bath.

  - **Metalvac E WS UV.** This grade is suitable for labels that need to be wet strength and that are going to be printed with UV dried inks. It is not suitable for returnable bottle labelling.

The product Metalvac E WS is made in 60, 65, 70 and 75 g/m^2. Generally the 60 and 65g/m^2 are used on bottlenecks, whilst those of 70 and 75 g/m^2 are used for labels on the front of the bottle.

- **Metalvac A.** This product is exclusively for self-adhesive labels. As in other cases, the product should have a special resistance to traction in order to withstand matrix stripping when printing takes place on bobbins. It is made in 85 g/m^2.

- **Metalvac A WS.** This corresponds to the previous product but with a special treatment for use in labelling returnable bottles. It is made, like the former, in 85 g/m^2.

- **Metalvac T.** This is used in the inner wrapping of cigarette packets. Its main characteristic is that it does not release dust during the process of formation of the packet, thereby preventing contamination by small particles of aluminium. It is made with water-based varnishes to prevent the transfer of odours and flavours. It is made in 50 and 60 g/m^2, and is not printed.

- **Metalvac R.** This is used for gift wrapping and bags, and for lining gift boxes, as well as decoration. It has good mechanical resistance and a very glossy finish, and is suitable for all printing systems. It is made in 50, 55, 60, 65 and 70 g/m^2.

- **Metalvac F.** This product is used for the production of wrapping for chocolate and food products in general. The main difference between this and other products in the range is a special treatment that guarantees that it does not give off odours and flavours which could damage the foods. It can be printed on any printing system and even with ultraviolet inks. It is made in weights of 85 and 95 g/m^2.

- **Metalvac B.** This paper is specially designed for tablecloths, doilies, and pastry and charcuterie trays. As well as not transferring odours and flavours to the foods, it has also been treated to prevent it from being damaged by alcohol. It is not recommended for printing and is made in 55, 60, 65 and 70 g/m^2.

- **Metalvac CS.** This is metallized cardboard specially designed for luxury packaging of products such as perfumery, cosmetics, cavas, wines, etc. It can be printed using any printing system and is made in 300 g/m^2.

8. Technical characteristics of the substrate

To achieve a good metallized product it is important that a suitable substrate is used. Irrespective of the final use, substrates should meet the following general characteristics:

- High smoothness, given that the varnish is applied in gravure, as previously explained.
- Composition of coating suitably resistant to solvents when working with a solvent base. In this case, the coating should be strengthened with latex. When working with a water base it should have a sufficiently low Cobb value to prevent excessively fast absorption of water by the coating.

- Good surface regularity, as any incident will affect the finished product.

- Application of the coating preferably in two coats and the layer should be polymerized so that it does not lose weight.

- The retention of residual solvents should be avoided.

- They should meet with European regulation EN-71 on their content of heavy metals (mercury, cadmium and chromium).

- Degasification in the high vacuum machine should be at least equal to the release of moisture. This affects the vacuum leading to faults in the metallization. Drying the paper in excess to counteract an excess of degasification can impair the recoverability of the conditions of the paper.

Furthermore, depending on the finished product that is going to be made, substrates should meet a series of specific characteristics. We will now provide a list of the specific characteristics of the substrates according to the final applications of the metallized paper.

9. Quality control

As well as the controls that take place in the machines during the process which have already been described, a series of controls is also carried out in the laboratory first. These controls affect:

- The paper substrate.
- Other raw materials.
- The finished product.

9.1. Controls of the substrate

Before entering the machine, all substrates undergo a series of general controls carried out in the laboratory. In addition, other specific controls are also carried out for WS grades. All of these are displayed in the following table:

CONTROLS OF THE SUBSTRATE	
General controls	▣ Weight. ▣ Calliper. ▣ Gloss. ▣ Start-up. ▣ Paper's resistance to traction. ▣ Varnishability. ▣ Smoothness. ▣ Rigidity. ▣ Moisture level. ▣ DHT.
Controls for WS grades	▣ Paper's resistance to traction. ▣ Resistance to caustic soda. ▣ Release time. ▣ Transfer time. ▣ Loss of weight in caustic soda.

9.2. Controls of other raw materials

In this section we refer to the controls that fundamentally affect the different chemical products that are used in the production of varnishes and lacquers**.** The following controls are usually made:

CONTROLS OF RAW MATERIALS FOR VARNISHES AND LACQUERS
▣ Solids. ▣ Viscosity. ▣ Density. ▣ Acidity index. ▣ Boiling point.

9.3. Controls of the finished product

Many of the tests carried out in the laboratory with the finished products coincide with those done on the substrates, meaning that in this section we will only examine the tests that are most relevant relative to the final use. These tests are shown in the following table (if you click on the icons you can see how each test is performed):

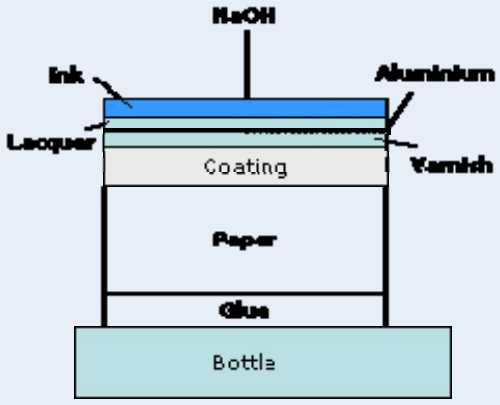
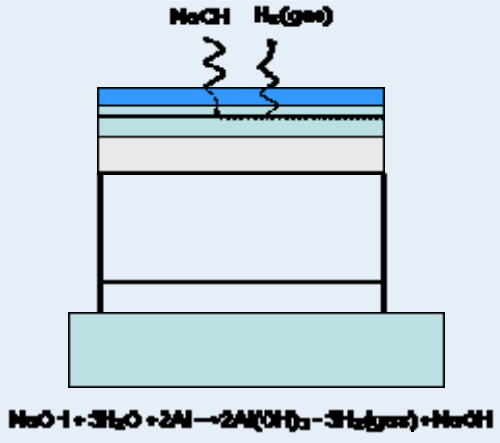
Test	
Transfer and release time (wash-off)	This test measures the time that caustic soda takes to cross the label to release it from the bottle.
Permanence of printing	This is performed to guarantee that the ink will remain on the label when the bottle is washed without causing contamination in the washing bath.
Loss of weight	Although the ink should remain on the label it is obvious that due to the caustic soda and the temperature of the washing bath there will always be a loss that needs to be controlled.
Odour (Robinson test)	This test is specifically for products designed for food use. It analyzes the transfer of tastes to foods.
Resistance to alcohol	This analysis is typical for products that are to be used in doilies; as with certain foods such as cakes the use of products such as wines or liqueurs is common. It is therefore necessary to measure the behaviour of the product when in contact with alcohol to avoid contaminating the cakes.

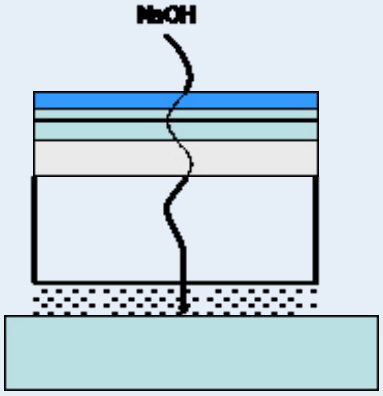
Metallized Paper

The first three tests ("transfer and release time", "resistance of printing" and "loss of weight") are typical of WS products (or in other words, returnable bottle labels). These generate more problems owing to the fact that they need to undergo a process of recuperation.

The main product made with metallized paper is returnable beer bottle labelling. This product should combine the qualities of good ink retention in the hot caustic soda bath and, at the same time, good permeability of the printed product to the caustic soda so that the label is released from the bottle in an acceptable time.

The process of recuperating the bottles takes place in a bath of caustic soda and can be divided into three phases that we will now explain:

PROCESS OF RECOVRING BOTTLES WITH WS PRODUCTS		
1st	Once the contents are consumed, the bottle and its printed label are submerged in a washing cycle with an alkaline solution made up of hot caustic soda (NaOH). Next, the caustic soda starts to cross the product through the layer of ink.	
2nd	Once it passes the layer of ink and lacquer, the alkaline solution reacts with the aluminium making it dissolve. During the chemical reaction, gaseous hydrogen (H_2) is generated which goes to the exterior in the form of bubbles. At this point, the film of lacquer sticks to the varnish thereby ensuring the integrity of the product and the retention of the inks.	

3rd	Finally, after crossing the remaining layers the caustic soda reaches the adhesive and dissolves it, thereby causing the label to come off the bottle.	

Metallized Paper

Unit summary

Metallized paper	This is a product which has a layer of aluminium on the coated substrate in order to give the finished product decorative and protective properties. It can have a matte or gloss finish. In addition, it can be smooth or embossed, as well as silver or gold in colour.
Methods of metallization	The metallized paper can be obtained using one of two systems: ▣ **Lamination:** consists of gluing a paper (normally not coated) to a sheet of aluminium of between 9 and 12 microns. ▣ **Vacuum metallization:** consists of placing a very thin layer of aluminium of between 0.08 and 0.1 g/m^2 on a 1-side coated substrate. In turn this method is divided into two types: ▸ **Transfer** metallization. ▸ **Direct** metallization.
Direct high vacuum metallization	This is the method used by Torraspapel. It consists of three processes: ▣ **Varnishing of the substrate:** a layer of varnish is applied to the coated substrate to prepare the surface. ▣ **Metallization:** the layer of aluminium is applied inside a metallization chamber where a high vacuum is generated. ▣ **Lacquering:** A thin layer of lacquer is applied to give the final characteristics of the paper. A treatment known as **embossing** is also carried out on some grades, modifying the appearance and certain properties of the finished product.
Types of metallized paper	Some of the uses of metallized paper are: labels, cigarettes, self-adhesives, gifts, packaging and food uses. Our products

	are known as **Metalvac**, and their specialities and applications are: ▣ Metalvac E: for non-returnable bottle labels. ▣ Metalvac E WS. labels to provide resistance in wet conditions. ▣ Metalvac A: self-adhesive labels. ▣ Metalvac A WS: self-adhesive labels for returnable bottles. ▣ Metalvac T: tobacco. ▣ Metalvac R: for gift wrapping, etc. ▣ Metalvac F: for wrapping food products. ▣ Metalvac B: tablecloths and doilies. ▣ Metalvac CS: luxury packaging.
Quality control	The controls performed in the laboratory affect the paper substrate, other raw materials (varnishes and lacquers) and the finished product. The most relevant tests carried out in the laboratory on the finished product are: ▣ Transfer and release time. ▣ Permanence of printing . ▣ Loss of weight. ▣ Odour. ▣ Resistance to alcohol.

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